

Amendments to the Drawings:

The attached sheet of drawings includes changes to Figs. 5a, 5b and 5c. This sheet replaces the previous sheet including Figs. 5a, 5b and 5c. Reference lines for reference numbers 50 and 57 have been clarified.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

REMARKS

The Office Action dated February 17, 2005 has been carefully considered. Claim 9 has been amended. Claims 1, 2, 4-17 and 19 are in this application.

Claim 9 has been amended to recite a splash collision plate having either an opening area ratio of the splash collision plate in the range of 30% to 70% when a dualflow tray is used as the splash collision plate or a total opening area of the splash collision plate and a segmental opening in the range of 10% to 90%, relative to a cross section of the column, when a disc-and-doughnut type collision plate and/or a segment baffle type collision plate is used as the splash collision plate. Support for this amendment is found throughout the specification and in particular on page 14, lines 23-24 and 26-32. No new matter has been entered.

The Examiner indicated that "it is also noted that Figs. 1-4 are indicated, e.g., at page 4, lines 9-20 of the specification, as being "conventional" and therefore should be designated by a legend such as --Prior Art-- because only that which is old is illustrated." Applicants note that Figs. 1-3 are marked as prior art. Fig. 4 is directed to the present invention.

The Examiner indicated that both 57 and 55 and 50 and 52 appear to be pointing at the same thing. Applicants revised the drawings and clarified the reference lines and submit that 55 points to a washer, while 57 points to a fixing part which is a general area, including, bolt 56, washer 55 and nut 54. Applicants submit that 52 points to support ring 52, while joint part 50 points to the joint between support ring 52 and inner wall 53.

The previously presented claims 1, 2, 4-8, 10-17 and 19 were rejected under 35 U.S.C. § 103 as obvious in view of U.S. Patent No. 6,214,174 to Matsumoto et al. ("Matsumoto '174") with or without U.S. Patent No. 4,304,738 to Nutter.

The Examiner stated that although Matsumoto et al. do not specifically mention the liquid passing openings in the joint part between the support ring and the inner well, Matsumoto et al. disclosure at col. 4, lines 47-56 would be at least suggestive of the limitations. Applicants submit that the USPTO bears the burden of establishing a *prima facie* case of obviousness under 35 U.S.C. § 103. *In re Deuel*, 51 F.3d 1552, 1557 (Fed. Cir.

1995); *In re Rijckaert*, 9 F.3d 1531, 1532 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, the USPTO must first show that the prior art suggested to those of ordinary skill in the art that they should make the claimed composition or device or carry out the claimed process. Second, the USPTO must show that the prior art would have provided one of ordinary skill in the art with a reasonable expectation of success. Both the suggestion and the reasonable expectation of success must be adequately founded in the prior art and not in an applicant's disclosure. Third, the USPTO must show that the prior art teaches or suggests all the claim limitations. *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

Applicants submit that the cited references do not teach providing a liquid passing opening to a joint part between the support ring and the inner wall of the column as defined in present claim 1. To the contrary, Matsumoto et al. disclose openings between the joint and the wall. Comparing the opening of Matsumoto et al. with the liquid passing opening of the present claim 1, there is difference of the placement of the openings. In accordance with the horizontal clamp by Matsumoto et al., puddles tend to occur nearby the clamp to polymerize. Applicants submit that the horizontal clamps have a defect that in distillation, puddles occur on plate parts, in particular lots of joint parts, and when distillation is further continued, polymerization tends to occur. On the plate connections where liquid tends to gather, its polymerization is not prevented. It is not easy for persons skilled in the art to find means to solve the problem on the connection part of the tray in the distillation columns for easily polymerizable substance. It has surprisingly been found that in the present invention, in order to prevent the formation of puddles on conventional dual flow trays, a tray is connected with a vertical clamp, and at the connection place, a liquid passing opening is made, thereby preventing the formation of puddles and long operations are attained. Comparative example 1 of the present application is directed to a horizontal clamp. Comparative example 2 of the present application indicates an example without liquid passing an opening. Both have deficiencies about the occurrence of accumulates and polymers. In contrast, examples 1 and 2 of the present invention exhibit advantages as described in the Declaration of Tetsuji Mistumoto submitted herewith.

Furthermore, Nutter does not describe liquid passing openings, and describes no hint that a liquid passing opening is made in the connection part so as to prevent the formation of puddles thereon.

Accordingly, the invention defined by the present claims is not obvious in view of Matsumoto '174 in combination with Nutter and withdrawal of this rejection is respectfully requested.

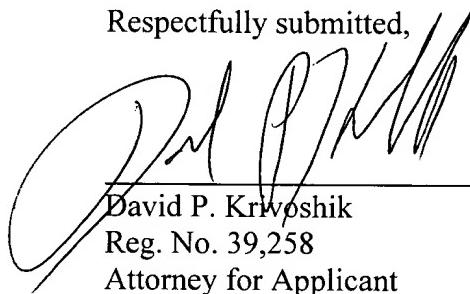
Claim 9 was rejected under 35 U.S.C. § 103 as obvious in view of Matsumoto '174 and U.S. Patent No. 6,641,700 to Matsumoto et al. ("Matsumoto '700"). Applicants submit that the teachings of these references do not disclose or suggest the invention defined by amended claim 9.

The Examiner stated that Applicants fail to define how the structure of the splash plate differs from the plate described in Matsumoto et al. Applicants have added the limitation of an opening area ratio of the splash collision plate in the range of 30% to 70% to claim 9. Matsumoto '700 do not teach or suggest an opening area ratio of the splash collision plate in the range of 30% to 70%. In a vapor dispersing device of Matsumoto '700, vapor from the re-boiler is provided downwardly in the distillation column. In contrast, the splash plate of the present invention is used to cut the liquid splashed from the liquid surface in the distillation column and prevent the polymerization on the trays disposed above the collision plate. If the plate in claim 9 as amended is used in the device of Matsumoto '700, vapor dispersing ability will not be attained. Thus, the claimed splash plate is differentiated from the tray of Matsumoto '700.

Similarly, Matsumoto '174 do not teach or suggest performing purification by providing a splash plate in a lower part of a distillation column in which the splash plate includes an opening area ratio of said splash collision plate in the range of 30% to 70%. Accordingly, the invention defined by claim 9 is not obvious in view of Matsumoto '700 alone or in combination with Matsumoto '174.

In view of the foregoing, Applicants submit that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should she believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,



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Annotated Sheet Showing Changes

FIG. 5B

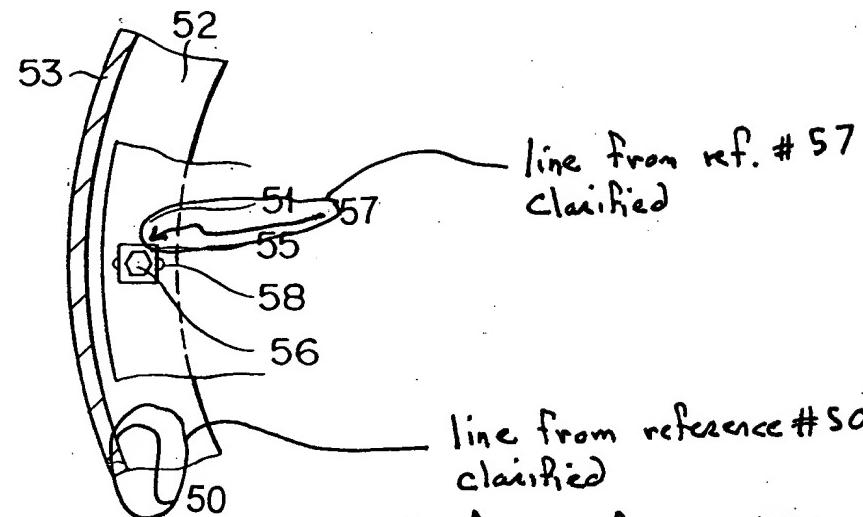


FIG. 5A

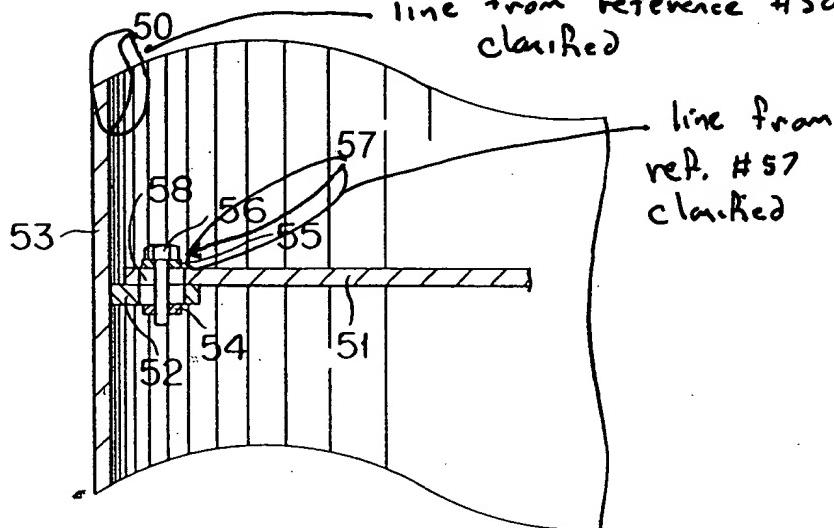


FIG. 5c

